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COMMONWEALTH OF PENNSYLVANIA
Department of Environmental Protection
Bureau of Laboratories
June 26, 1998
717-705-2196

SUBJECT: MAU Air Monitoring Report Concerning Emissions at the Drake Chemical Superfund Site Incinerator in Lock Haven, PA, June 1998

TO: Larry Newcomer, Project Officer
Environmental Cleanup Program
Northcentral Regional Office

FROM: Robert E. Conrad, Chief
Mobile Analytical Services
Bureau of Laboratories

The following text outlines the results obtained during the sampling excursions conducted at the Drake Chemical Superfund Site in Lock Haven, Clinton County, during Monday, June 15, 1998, to Friday, June 19, 1998.

To facilitate a better understanding of the operation of the instrument, several terms and concepts will be explained. A "scan" in this report refers to compound mass fragmentation patterns which result from the analysis of sampled air. The MAU scans a mass range from 75 Atomic Mass Units (AMU) to 350 AMU. This range in molecular weight provides for the majority of compounds present in the atmosphere. Compounds above 350 AMU are not commonly found in the atmosphere, while compounds with a molecular weight below 75 AMU are very difficult to identify due to clustering of water, nitrogen, and oxygen molecules around them. This clustering affects the mass fragmentation pattern of the compound of interest, thus making it unidentifiable. It should be noted that the compound analysis results generated by the TAGA IIE onboard the MAU are dependent upon the ambient atmospheric conditions and matrix effects. These environmental effects, such as atmospheric humidity, significantly increase the clustering effect and hinder analysis. A "background scan" refers to ambient air scans obtained in an area removed from the problem and represent a "non-contaminated" ambient air sample. These scans are then subtracted from the area ambient air scans obtained at the project site. The resulting spectra is termed a "background subtraction scan". The background subtraction scan is representative of those mass fragments present after the designated background ambient scan results are removed. The background subtracted scan is both characteristic and specific of the source of emissions and becomes the "reference spectra" for that source.

When a reference spectra is developed for a specific source, it is analyzed for those characteristics which can be used to differentiate it from other reference spectra. The first of these characteristics are the types of different compounds in the spectra. The second of these characteristics is their proportional intensity to each other and the third of these characteristics, is the production of true daughter spectra. Once all these factors/characteristics are catalogued, the reference spectra becomes the "fingerprint" for that source.

The four locations previously chosen by the Regional Office, designated as Potential Plume Impact Areas (PPIA), were assigned as potential downwind sampling locations. The MAU staff ascertained the wind direction each morning and retired to the PPIA closest to being down wind. The wind direction was reassessed every four hours and the Mobile Laboratory was repositioned accordingly. The four PPIA sites were:

- Lock Haven Airport (next to Hi-Vol Sampling Station)
- Keystone Central Vo-Tech School (Student Parking Lot)
- Lock Haven Hospital Parking Lot (adjacent to Hi-Vol Sampling Station)
- Corner of Keller and Fleming Streets (Castanea)

The intention was sample the assigned locations for an eight hour continuous period. The sampling data was used to determine if constituents of the ambient air scans at the PPIA were analogous to constituents (the reference spectra) of the Drake Chemical Site incinerator, while the incinerator was operational.

Sampling Result Summary:

Session 1: Monday, June 15, 1998 - 7:00 a.m. to 4:15 p.m.

7:00 a.m. A background ambient air scan was collected at the hotel.

8:00 a.m. Visual observation of the incinerator plume appears to be moving toward the area of the Lock Haven Hospital PPIA. MAU-1 was positioned at the Lock Haven Hospital and began the eight hour monitoring. Spectral identification provided no match with any of the catalogued incinerator spectra. Rain was documented throughout the sampling period. The average wind direction was from the East-Northeast at this location.

4:15 p.m. Sampling session concluded.

Session 2: Tuesday, June 16, 1998 - 7:10 a.m. to 4:15 p.m.

7:10 a.m. A background ambient air scan was collected at the hotel.

8:00 a.m. MAU-1 was positioned at the Lock Haven Airport. Ambient air scans provided no constituents to match with any catalogued incinerator spectra. The average wind direction was from the West-Southwest.

4:15 p.m. Sampling session concluded.

Session 3: Wednesday, June 17, 1998 - 7:00 a.m. to 4:15 p.m.

7:00 a.m. A background ambient air scan was collected at the hotel.

8:00 a.m. MAS staff began sampling at Lock Haven Airport. Ambient air scans provided no specific constituents to match with any catalogued incinerator spectra. Overnight rainfall, with the associated high moisture content of the ambient air, was documented throughout the sampling period. The average wind direction was from the West-Southeast at this location.

4:15 p.m. Sampling session concluded.

Session 4: Thursday, June 18, 1998 - 7:15 a.m. to 4:15 p.m.

7:15 a.m. A background ambient air scan was collected at the hotel.

8:00 a.m. Visual observation of the incinerator plume appeared to be moving towards the Lock Haven Airport. MAU-1 was positioned at the Lock Haven Airport. Ambient air scans provided no constituents to match with any catalogued incinerator spectra. The average wind direction was from the West-Northwest at this location.

4:15p.m. Sampling session concluded.

Session 5: Friday, June 19, 1998 - 6:10 a.m. to 3:00 p.m.

6:10 a.m. A background ambient air scan was collected at the hotel.

6:55 a.m. MAU-1 was stationed at Lock Haven Airport. Ambient air scans provided no constituents to match with any catalogued incinerator spectra. The average wind direction was from the West-Southwest at this location.

3:00 p.m. Facility shut down due to a feed problem. Sampling session concluded.

cc: Steve Webster
Chao-Chaun Liao
Thomas K. Richards
MAS File

Pennsylvania Department of Environmental Protection
208 West Third Street, Suite 101
Williamsport, PA 17701-6510

July 1, 1998

Northcentral Regional Office Fax 717-327-3420

Greg Crystall, Section Chief
Western PA Remedial Section
U.S. EPA Region III
841 Chestnut Building
Philadelphia, PA 19107

Re: Drake Chemical – MAU Sampling
Lock Haven, Clinton County

Dear Greg:

Please find enclosed for your information a copy of the reports prepared by Mr. Robert E. Conrad relaying the results of the Department's air sampling conducted by the Mobile Analytical Unit (MAU) during the period of June 15 to June 19, 1998 within the Lock Haven area. As the report indicates, the wind direction was established each morning to determine which of the four community air monitoring stations was located the closest to being downwind. The MAU was subsequently positioned at this location until a shift in the wind direction, as measured every four hours, indicated that a repositioning was necessary to maintain the unit in an area downwind from the Drake site.

The next scheduled MAU sampling period for the Lock Haven area is during the week of July 20, 1998. If you have any questions regarding the enclosed reports, please do not hesitate to contact this office at 717-327-3418.

Sincerely,

Larry S. Newcomer
Chief, Hazardous Sites Cleanup Section
Environmental Cleanup

cc: File

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COMMONWEALTH OF PENNSYLVANIA
Department of Environmental Protection
Bureau of Laboratories
June 26, 1998
717-705-2196

SUBJECT: Requested Addendum to Drake Chemical Site Monitoring Report, May 1998

TO: Larry Newcomer, Project Officer
Environmental Cleanup Program
Northcentral Regional Office

FROM: Robert E. Conrad, Chief
Mobile Analytical Services
Bureau of Laboratories

In response to our telephone conversation on June 16, 1998, you asked for further clarification pertaining to the monitoring results on Thursday, May 14, 1998, and Friday, May 15, 1998.

Thursday, May 14, 1998:

8:00 a.m. Two dominant compounds were detected, of which, one was tentatively identified as ethyltoluene. The term "dominant" is a relative term in this situation, as the components of the spectra were at the detection limits of the instrument. An estimated concentration of the ethyltoluene (since no calibration was performed) would be in the range of 2ppb to 4ppb and was only detected for several minutes.

3:50 p.m. The results from the bag sample gathered at the "excavation site" indicated the presence of 10 dominant compounds, from which four were tentatively identified. Three compounds were also at or near the detection limits of the instrument with an estimated concentration of 2ppb to 4ppb.

Friday, May 15, 1998:

Ambient scans at the airport detected the presence of two dominant compounds at 9:00 a.m. and four dominant compounds at 10:00 a.m. Each episode lasted a few minutes. Chlorobenzene was tentatively identified both times. It also was detected at or near the detection limits of the instrument with an estimated concentration of 2ppb to 4ppb.